Journal of Adolescent Health xxx (2017) 1–5

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

Preference for Solitude, Social Isolation, Suicidal Ideation, and Self-Harm in Adolescents

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Article history: Received November 9, 2016; Accepted February 22, 2017
Keywords: Preference for solitude; Social isolation; Suicidal ideation; Self-harm; Adolescence

A B S T R A C T

Purpose: Social isolation is associated with suicidal ideation (SI) and self-harm (SH) among adolescents. However, the association between preference for solitude (PfS), SI, and SH is unknown. The prevalence of adolescents who have both of PfS and social isolation and the risks for SI and SH among them are also unknown.
Methods: Information on PfS, social isolation, SI, and SH was collected in a large-scale school-based survey on adolescents, using a self-report questionnaire. Associations between PfS, SI, and SH were examined by logistic regression analysis. The interactions between PfS and social isolation on SI and SH were also investigated. The odds of SI and SH were examined for groups defined by presence of PfS and social isolation.
Results: Responses from 17,437 students (89.3% of relevant classes) were available. After adjusting for demographic characteristics and social isolation, PfS was associated with increased odds of SI (odds ratio [OR] = 3.1) and SH (OR = 1.9). There was no interaction between PfS and social isolation on SI and SH. After adjusting for demographic characteristics, the odds for SI (OR = 8.6) and SH (OR = 3.8) were highest among adolescents with both PfS and social isolation (8.4% of all respondents).

IMPLICATIONS AND CONTRIBUTION

Adolescents with a preference for solitude, particularly those who are socially isolated, are at increased risk of suicidal ideation and self-harm. These results suggest focusing suicide prevention efforts on those who say they prefer solitude and have no one to consult with about worries or troubles.

Conflicts of Interest: The authors have no conflicts of interest to disclose.
Clinical trials registry site and number: none.

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http://dx.doi.org/10.1016/j.jadohealth.2017.02.018

Conclusions: PfS was associated with increased odds of SI and SH in adolescents. No interaction effect between PfS and social isolation on SI and SH was found, but adolescents with PfS and social isolation had the highest risk for SI and SH. Parents and professionals should pay attention to suicide risk in adolescents with PfS.

Suicide is the second leading cause of death in young people, accounting for 8.5% of total deaths in young people [1]. In Japan, the leading cause of death among 15- to 39-year-olds is suicide, while road traffic accidents is the leading cause in many other developed countries [2]. Also, self-inflicted injury is one of the leading causes of disability-adjusted life years in young people [3]. Social isolation has been identified as a risk factor for suicidal problems [1,4]. Since a rapidly changing social world increases the likelihood of social isolation during adolescence [5], more attention should be paid for adolescents who experience social isolation.

Preference for solitude (PfS) in adolescence can be regarded as a developmental process. PfS has been said as a broad construct of unsociability and avoidance [6] and motivated by low approach and low-to-high avoidance [7]. The desire for solitude increases during adolescence, and time spent alone in adolescence can sometimes be beneficial for adjustment, perhaps because solitude facilitates individuation or identity formation [8]. As children grow older, solitude becomes more acceptable and they report solitude as more positive and important [8–10]. It has also been suggested that spending time alone in a volitional and autonomous manner is associated with higher levels of well-being [11]. On the other hand, negative aspects of PfS have also been reported. Several studies showed that PfS in early adolescence is associated with peer difficulties and maltreatment [12–14] and, in adolescence more generally, with low self-esteem, anxiety/depression, and emotional dysregulation [6,7]. Therefore, it is possible that risk for suicidal ideation (SI) and self-harm (SH) is increased in adolescents with PfS.

However, to the best of our knowledge, this has not been investigated. Furthermore, no studies have examined the prevalence of adolescents who had both PfS and social isolation and the risk of SI and SH among them. The objective of this study therefore was to examine these possible associations.

Methods

Study design

The present study was a cross-sectional survey of students in public junior and senior high schools (7th–12th graders, age range 12–18 years). The survey was conducted between 2008 and 2009 using a self-report questionnaire. The principal investigator of the study asked all heads and administrators of public junior high schools in the city of Tsu, (the second biggest city in a rural prefecture, having about 290,000 people), and public junior and senior high schools in Kochi Prefecture, (a rural prefecture, having approximately 780,000 people), to participate into the survey. Of the 138 junior and 36 senior high schools invited, 47 junior and 30 senior high schools participated.

Parents were informed of the research project by letter and asked to notify the school if they did not want their children to participate. On the day of the survey, students were told that participation was voluntary and there was no disadvantage in nonparticipation; they were then given the choice of opting out. Each teacher reported the total number of students present and absent on the day of the survey. The study was approved by the ethics committees of Tokyo Metropolitan Institute of Medical Science, Mie University School of Medicine, and Kochi Medical School.

Among 19,436 students in the relevant classes, 18,250 (93.8%) agreed to participate. Of the remainder, 798 (4.1%) were absent on the day of the survey and 388 (2.0%) declined to participate. Among the participants, 903 (4.9%) were excluded from the analysis because of incomplete answers to questions (numbers of missing data for PfS was 155, for social isolation was 267, for SI was 95, and for SH was 433). Thus, responses from 17,347 (95.1%) students were analyzed (89.3% of all students in the relevant classes). Of these students, 50.2% were female, and their ages ranged from 12 to 18 years, with a mean age of 15.2 years (standard deviation = 1.7 years).

Measurements

The participants were asked to fill in an anonymous self-report questionnaire including questions about PfS, social isolation, SI, SH, and demographic characteristics including age, sex, and living status.

Preference for solitude

The question, “Do you prefer to be alone rather than to be with someone?” was used to evaluate PfS. This question had the highest loading among the four items for measuring PfS in the previous study [6]. The four possible responses were “no,” “probably no,” “probably yes,” and “yes.” Students who replied “yes” or “probably yes” were defined as those who had PfS.

Social isolation

In this article, considering the previous studies [15], we defined social isolation as the lack of quantity of social contacts for emotional support. The question “With how many people can you consult about your worries or troubles?” was used. The five possible responses were “no one,” “one,” “two,” “three,” and “more than four.” Individuals who answered “no one” were defined as those who were socially isolated.

Suicidal ideation

Current SI was assessed by the question “Do you currently have thoughts that your life is no longer worth living?” The four

possible responses were “no,” “probably no,” “probably yes,” and “yes.” Responses of “yes” or “probably yes” were regarded as the presence of current suicidal feelings.

Self-harm

The question “Have you intentionally hurt yourself within the past year?” was used to measure the 12-month prevalence of SH. The two possible responses were “no” and “yes.” Based on the definition used in a previous study [16] and in a comparative study of seven countries [17], SH was defined as an act with a nonfatal outcome in which an individual deliberately did one or more of the following: initiated behavior (e.g., self-cutting and jumping from a height) which was intended to cause SH; ingested a substance in excess of the prescribed or generally recognized therapeutic dose; or ingested a substance or object not intended for ingestion. Classification of the episode as SH or otherwise was based on independent ratings by two researchers using these criteria. The kappa value for agreement between the two raters was .83 (95% confidence interval [CI]: .79–.86). Any classification discrepancies between the two raters were resolved by discussion.

Statistical analysis

Associations between PfS, SI, and SH were investigated using logistic regression analysis. Multivariable logistic regression analysis was conducted to control for the effects of demographic characteristics and social isolation. A possible interaction effect between PfS and social isolation on SI and SH was also tested. Linear regression analysis treating PfS, SI, and SH as ordinal variables was also conducted. Next, students were divided into four groups according to the presence of PfS and social isolation (group 1: PfS−/social isolation−, group 2: PfS−/social isolation+, group 3: PfS+/social isolation−, and group 4: PfS+/social isolation+; Figure 1). Risk for SI and SH in these four groups was investigated using multivariable logistic regression analysis.

Results

Seventeen thousand three hundred forty-seven adolescents were included in this study. The mean age was 15.2 (standard deviation = 1.7), and the prevalence of PfS and social isolation were 29.9% and 17.2%, respectively. The prevalence of current SI and 12-month prevalence of SH were 11.5% and 3.8%, respectively. The prevalence of PfS increased with age ($p < .01$, Table 1). The prevalence of social isolation increased with age in boys ($p < .01$).

PfS was associated with increased odds of SI (odds ratio [OR] = 3.7, 95% CI: 3.4–4.1, $p < .001$, Table 2). Adjusting for demographic characteristics and social isolation slightly attenuated this association although it remained significant at the 5% level (adjusted OR = 3.1, 95% CI: 2.8–3.4, $p < .001$). Similarly, PfS was associated with the increased odds of SH (OR = 2.2, 95% CI: 1.9–2.6, $p < .001$). This association was also slightly attenuated by adjusting for demographic characteristics and social isolation, although again it remained significant at the 5% level (adjusted OR = 1.9, 95% CI: 1.6–2.3, $p < .001$). There was no statistically significant interaction effect at the 5% level between PfS and social isolation on SI ($p = .70$) and SH ($p = .06$). Linear regression analyses in which PfS and SI were treated as ordinal variables showed that students with stronger PfS had stronger SI (adjusted: B = .263, $p < .001$). The sensitivity analysis in which PfS was treated as an ordinal categorical variable in logistic regression analyses showed that stronger PfS was associated with the increased odds of SH (adjusted OR = 1.401, $p < .001$).

More students with PfS experienced social isolation than those without PfS (28.1% vs. 12.6%, $p < .001$). Logistic regression analysis showed that odds of SI were higher in group 2, 3, and

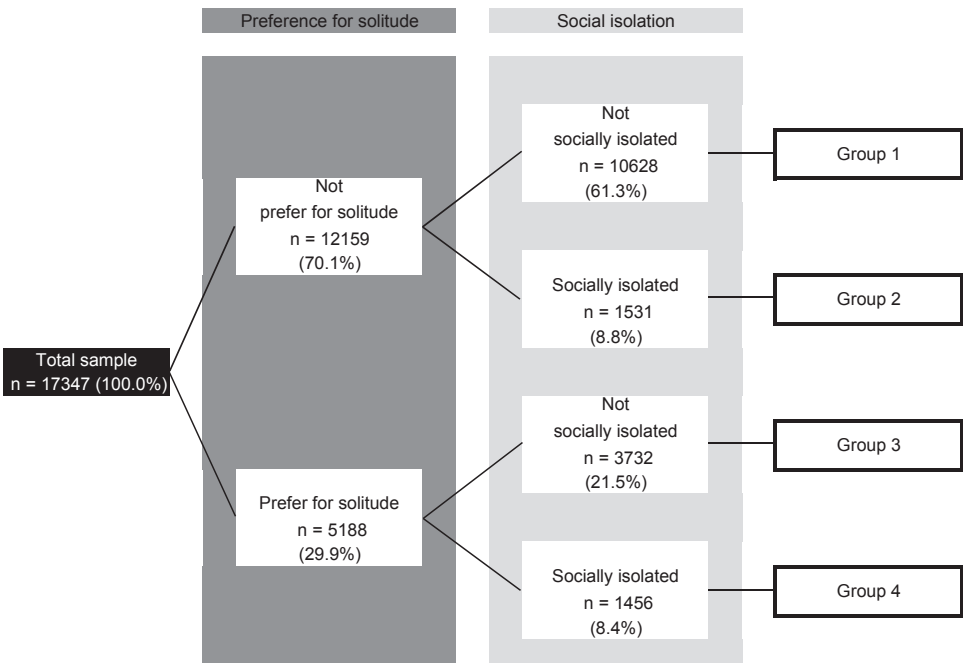

Figure 1. Distribution of four groups defined by the presence of preference for solitude and social isolation.

Table 1
Prevalence of preference for solitude and social isolation in different age and sex groups

Sex	Age	N	PfS, n (%)	*p* value	Social isolation, n (%)	*p* value
Boys	12	360	76 (21.1%)	<.001[a] (for age difference)	69 (19.2%)	.001[a] (for age difference)
	13	1,458	333 (22.8%)		298 (20.4%)	
	14	1,478	392 (26.5%)		358 (24.2%)	
	15	1,474	413 (28.0%)		333 (22.6%)	
	16	1,594	531 (33.3%)		365 (22.9%)	
	17	1,409	471 (33.4%)		339 (24.1%)	
	18	869	310 (35.7%)		229 (26.4%)	
				.052 (for sex difference)		<.001 (for sex difference)
Girls	12	326	69 (21.2%)	<.001[a] (for age difference)	41 (12.6%)	.977[a] (for age difference)
	13	1,358	350 (25.8%)		160 (11.8%)	
	14	1,404	388 (27.6%)		148 (10.5%)	
	15	1,472	442 (30.0%)		160 (10.9%)	
	16	1,694	554 (32.7%)		205 (12.1%)	
	17	1,559	549 (35.2%)		188 (12.1%)	
	18	892	310 (34.8%)		94 (10.5%)	

PfS = preference for solitude.
[a] *p* value for chi-square for trend.

4 compared with group 1 (all $p < .01$; Table 3). Multivariable logistic regression analysis adjusting for demographic characteristics showed similar results. The odds of SI were highest in group 4 and were 8.6 times higher than that of in group 1. Similar results were observed with regard to the risk for SH. For multivariable logistic regression analysis adjusting for demographic characteristics, the odds of SH was higher in group 3 and 4 compared with group 1 ($p < .001$, Table 3). The odds of SH were highest in group 4 and were 3.8 times higher in group 4 than that of in group 1.

Discussion

This was the first study to investigate risk of suicidal problems among adolescents who had PfS and were socially isolated. PfS was associated with increased risk of SI and SH. Furthermore, PfS and social isolation had no interactive effect on SI and SH, and adolescents with PfS and social isolation were at the highest risk for SI and SH.

The prevalence of PfS and social isolation increased with adolescent age. This may reflect the fact that solitude becomes more normative in late adolescence than in early adolescence [9]. The association between PfS and social isolation was consistent with a previous finding that a positive correlation between peer loneliness and positive attitude to solitude exists. [18].

PfS was associated with increased odds of SI and SH of adolescents. This is consistent with previous studies showing that adolescents with PfS had more depressive symptoms than those without [9,10]. Adolescents with PfS may internalize negative peer views on withdrawal, which is especially strong in early adolescence [12], leading to SI and SH. Also, since the quality of peer relationships affects psychological well-being in adolescence [4], adolescents with PfS may tend to feel alienated and suicidal if not belonging to peer groups.

Furthermore, PfS and social isolation had no interactive effect on SI and SH, and PfS did not mitigate the effect of social isolation on SI and SH. Adolescents with PfS and social isolation had the highest odds of SI and SH. This result does not seem to accord with a previous finding that higher levels of well-being were associated with spending time alone in a volitional and autonomous manner [8]. However, PfS may not always be volitional and autonomous and may arise from lack of social contact. There may be many adolescents who might try to rationalize that they prefer solitude, even if they feel lonely and uncomfortable with their isolated state. PfS may be a complicated construct rather than a simple one. Solitude facilitates individuation or identity formation [8] and is associated with higher levels of well-being [11]. On the other hand, PfS is associated with peer difficulties and maltreatment [12–14], low self-esteem, anxiety/depression, and emotional dysregulation [6,7].

The main strength of this study was the large sample and the high response rate. On the other hand, there were several limitations. First, the sample consisted of participants who were in attendance at school on the day of the survey. Second, the data were cross-sectional, and therefore no causal relationship between PfS and suicidality can be inferred from this study. Third, we used single-item measures to make the questionnaire as short as possible. This effort enabled the high response rate, but we should consider the use of single-item measures as a limitation. Fourth, since no data on suicide attempts were obtained in our study, we could not examine the association between PfS and suicide attempt.

Table 2
Associations between preference for solitude, suicidal ideation, and self-harm

Model	Adjusted for	SI			SH		
		OR	95% CI	*p* value	OR	95% CI	*p* value
1	PfS	3.7	3.4–4.1	<.001	2.2	1.9–2.6	<.001
2	PfS + demographic factors[a]	3.6	3.3–4.0	<.001	2.2	1.9–2.5	<.001
3	PfS + demographic factors[a] + social isolation	3.1	2.8–3.4	<.001	1.9	1.6–2.3	<.001

95% CI = 95% confidence interval; OR = odds ratio; PfS = preference for solitude; SH = self-harm; SI = suicidal ideation.
[a] Demographic factors included age, sex, and living with parent(s).

Table 3
Associations between four groups and suicidal problems

	PfS	Social isolation	SI						SH					
			Unadjusted model			Adjusted model[a]			Unadjusted model			Adjusted model[a]		
			OR	95% CI	*p* value	OR	95% CI	*p* value	OR	95% CI	*p* value	OR	95% CI	*p* value
Group 1	−	−	Reference			Reference			Reference			Reference		
Group 2	−	+	2.3	2.0–2.8	<.001	2.8	2.4–3.3	<.001	1.1	.8–1.5	.640	1.7	1.2–2.3	.002
Group 3	+	−	3.2	2.8–3.6	<.001	3.1	2.8–3.5	<.001	2.0	1.6–2.4	<.001	1.9	1.5–2.2	<.001
Group 4	+	+	7.7	6.8–8.8	<.001	8.6	7.5–9.9	<.001	3.1	2.5–3.8	<.001	3.8	3.0–4.8	<.001

95% CI = 95% confidence interval; OR = odds ratio; PfS = preference for solitude; SH = self-harm; SI = suicidal ideation.
[a] Adjusted for demographic characteristics (age, sex, and living with parent(s)).

However, an important clinical implication can be induced. Professionals who work with adolescents should note that adolescents with PfS are more likely to be suicidal than those without PfS. Also, professionals should note that adolescents who preferred solitude and were socially isolated were at the highest risk of SI and SH. Recent research showed that perceived support from parents and schools may be important for suicide prevention among adolescents [19]. Parents and relevant professionals should pay attention to socially isolated adolescents and consider support for them even if they say that they prefer solitude. It may be also worth considering a school education program which promotes attention and care for students who prefer for solitude.

Acknowledgments

The authors are grateful to all the adolescents who took part in this study as well as the Board of Education of Tsu City and Kochi Prefecture for their cooperation and assistance in conducting this research.

Funding Sources

This work was supported by the Ministry of Health, Labour and Welfare of Japan Scientific Research Grant (#19-kokoro-ippan-012), the Ministry of Education, Culture, Sports, Science and Technology of Japan Scientific Research Grant on Innovative Area (23118004; Adolescent Mind & Self-Regulation) and the Tokyo Metropolitan Institute of Medical Science Project Grant (kokoronokenko H27-H32). This study was also supported in part by JSPS KAKENHI Grant Number JP16H06395, 16H06398, 16H06399 and 16K21720.

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